

WHAT IS CLAIMED IS:

1 1. A surge suppressor comprising:
 2 an inner conductor for conducting signals; and
 3 a spiral inductor coupled between said inner
 4 conductor and a ground connection, wherein said spiral
 5 inductor operates at a predefined RF impedance to propagate
 6 said signals along said inner conductor during normal
 7 operation and to dissipate electrical energy to said ground
 8 connection during a surge condition.

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 1 2. The surge suppressor of claim 1 wherein said
 2 inner conductor is disposed within a cavity of a housing, said
 3 inner conductor and said cavity forming a coaxial line.

1 3. The surge suppressor of claim 1, further
 2 comprising a surge blocking device coupled to said inner
 3 conductor and said spiral inductor for attenuating said
 4 electrical energy therethrough.

1 4. The surge suppressor of claim 1, further
 2 comprising a surge blocking means coupled to said inner
 3 conductor and said spiral inductor for blocking said
 4 electrical energy therethrough.

1 3². The surge suppressor of claim ²3 wherein said
 2 inner conductor and said surge blocking device are disposed
 3 within a cavity of a housing, said inner conductor and said
 4 cavity forming a coaxial line.

1 4². The surge suppressor of claim ²3 wherein said
 2 surge blocking device comprises first and second plates and
 3 first and second transitions collectively forming a structure
 4 having a predefined impedance.

1 5². The surge suppressor of claim ²3 wherein said
 2 surge blocking device is selected from a group consisting of a

3 capacitor, parallel rods, coupling devices, and conductive
4 plates.

Sub 1
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3 8. The surge suppressor of claim 1 wherein said spiral inductor has a shape selected from a group consisting of archemedes, logarithmic, and hyperbolic.

1 8.9. A surge suppressor for discharging an
2 electrical surge to ground comprising:
3 a housing having a cavity, a surge port, and a
4 protected port;
5 an inner conductor disposed within said cavity of
6 said housing for transmitting and receiving radio frequency
7 signals;

8 a spiral inductor disposed within said cavity of
9 said housing, said spiral inductor having an inner spiral
10 electrically coupled to said inner conductor and an outer
11 spiral electrically coupled to said housing for discharging
12 electrical energy to a ground connection; and

13 a capacitive device disposed within said cavity of
14 said housing and electrically coupled to said inner conductor
15 and said spiral inductor for attenuating said electrical
16 energy therethrough.

1 9 10. The surge suppressor of claim 8, further
2 comprising an insulating member disposed within said cavity of
3 said housing and coupled to said inner conductor for
4 supporting said inner conductor in said cavity to electrically
5 isolate said inner conductor from said housing.

1 10 11. The surge suppressor of claim 8 wherein said
2 capacitive device comprises first and second plates and first
3 and second transitions collectively forming a structure having
4 a predefined impedance.

1 11 12. The surge suppressor of claim 8 wherein said
2 inner conductor and said cavity forming a coaxial line.

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13. A method of determining the inductance of a spiral inductor of a surge suppressor comprising the steps of:
determining a lower bandwidth limit;
determining a desired impedance;
calculating a cutoff frequency by dividing said lower bandwidth limit by a constant;
determining an initial value for the inductance;
determining a cavity dimension;
determining inductor constraints; and
measuring an inductance value.

14. The method of claim 13 wherein said constant is approximately equal to 8.

15. The method of claim 13 wherein said desired impedance is approximately equal to 50 ohms.

16. The method of claim 13 wherein said step of determining an initial value for the inductance is determined by dividing the desired impedance by the product of approximately 12.6 and the cutoff frequency.

¹²
~~17~~. A communications system comprising:
communications equipment coupled to an antenna for receiving and transmitting signals via an inner conductor; and
a surge suppressor for blocking excessive electrical energy developed at said antenna or on said inner conductor during a surge condition, the surge suppressor comprising:
a spiral inductor coupled between said inner conductor and said ground connection, wherein said spiral inductor operates at a predefined RF impedance to propagate said signals along said inner conductor during normal operation and to dissipate said electrical energy to a ground connection during said surge condition.

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~~18~~. The communications system of claim ¹²~~17~~ wherein said surge suppressor further comprising a capacitive device

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1 19. The communications system of claim 17 wherein
2 said surge suppressor further comprising a housing having a
3 cavity configured to dispose said spiral inductor therein.

20. The communications system of claim 19 wherein
said surge suppressor further comprising an insulating member
disposed within said cavity and coupled to said inner
conductor for supporting said inner conductor in said cavity
to electrically isolate said inner conductor from said
housing.